d. Centrex

The carriers that disclose their standards utilize similar benchmarks; Bell Atlantic appears to have the highest and Nevada Bell the lowest. United and U S West do not disclose their standards.

e. 911 service

Once again, the carriers that disclose their standards appear similar. Bell Atlantic appears to have the highest and Ameritech and Nevada Bell appear to have the lowest. GTE, United, and U S West do not disclose their standards.

5. Satisfactory performance of a central office

The carriers' standards for noise, loss, balance, and gain slope of interoffice trunks appear similar to their standards for end user circuits. In addition, all of the carriers except, apparently, GTE, measure central office performance based on office overflow, dial speed, outgoing call set up troubles, incoming call setup troubles, billing accuracy, and customer trouble reports, using a tool called the Network Switch Performance Measurement Plan.

6. Bit error rate and availability standards

The carriers agree that bit error rate and availability do not apply to voice grade services because they are analog rather than digital. In addition, most of the carriers state that error-free seconds, not bit error rate, is the best measure for digital transmission quality.

a. Wideband digital

Only Bell Atlantic reports error-free seconds for this service (98.75%). Only BellSouth (98.75%) and GTE (99.925%) report availability. The service is not offered by Ameritech, Nevada Bell, Southwestern Bell, United, and U S West, and the other carriers have no standards.

b. DDS

All the carriers that disclose standards report 99.875% error-free seconds for interstate circuits and, in most cases, 99.5% for intra-state circuits. Pacific Bell and NYNEX have the highest availability (99.96%). None of the carriers except GTE reports a bit error rate standard.

c. DS1

Error-free seconds:

Pacific Bell has the highest standard (99.85%) BellSouth, New England, and New York reported the lowest standard (95%) In parts of New York, where service is provided completely over fiber optic facilities, NYNEX reports a separate standard of 98.75%.

Availability:

U S West's self-healing offering is highest (99.985%) Bell Atlantic is lowest (99.925%)

Bit error rate:

GTE, Nevada Bell, Pacific Bell, and U S West report 1.0x10-9 (U S West reports 10-6 for copper). United report 1.0x10-7.

BellSouth has no availability standard. GTE and United have no standard for error-free seconds, and Ameritech, Bell Atlantic, BellSouth, New England, New York, and Southwestern have no bit error rate standard.

d. DS3

Error-free seconds:

Highest: BellSouth (99.9% over 24 hours), Southwestern Bell (99.9% for new facilities)

Lowest: Ameritech, New England, New York, U S West (99.0 over 24 hours)

No standard - GTE, United

Availability:

Highest : U S West (99.985% for self- healing offering, 99.98% for other)

Lowest: BellSouth, New England, New York (99.925%)

No standard: Bell Atlantic, GTE, Nevada

Bit error rate:

Highest: GTE (1x10-10); Pacific Bell and U S West report 1x10-9; United reports 1x10-7; no other carrier has a standard

7. Internal Standard for Trunk Blockage

Most carriers design for 0.5% blockage on equal access trunks and 1.0% for other trunks. New England, New York, and United, however, apparently design for 1% in all areas. In addition, U S West's standard is 1.0% for end office-to-end office trunks, and that no more than 1.4% of end office-to-tandem trunk groups exceed 2% blockage.

8. Internal Standards for Switch Downtime

The carriers generally use a standard of no more than 3 minutes unscheduled down time for all categories of switches. Ameritech said that its standard is 98.5%, but did not explain what this means.

Section II: Questions Regarding Compliance With Standards

1. Procedures for collection of information from individual wire center

With the apparent exception of U S West, none of the LECs tracks all service quality criteria at the wire center level. Some LECs track trouble reports at the wire center level and all appear to track trunk blockage for each trunk group and switch down-time for each central office. In addition, all LECs, except apparently GTE, use the Network Switch Performance Measurement Plan to measure end office switch performance. Many of the LECs also employ customer satisfaction surveys, as well as mechanized data collection procedures, for determining the adequacy of their performance.

2. Ensuring compliance by wire centers, attention to rural areas

The LECs rely on analysis of reported data (which, however, is often aggregated at a higher geographic level) and customer satisfaction surveys to identify weak spots. In addition, some carriers (GTE and Pacific Bell) use random, wire center-specific audits to assess performance, and the others (with the apparent exception of Nevada Bell) use audits to examine specific aspects of performance. All carriers state that they apply the same standards to urban and rural areas and have no special procedures aimed at rural areas.

3. Compliance records

All carriers report that they generally met their internal standards during the second quarter, although the compliance records are usually examined on a state-wide,

rather than a wire center-specific, basis. GTE, Pacific, and U S West provide detailed compliance information; the other carriers are less responsive. Two matters warrant particular emphasis:

First: Several carriers report a multitude of unscheduled switch outages totalling 328 in the second quarter of 1991 alone, with 157 of these attributable to GTE. The causes of these outages are not specified.

Second: None of the carriers currently measures bit error rate, availability, and error-free seconds except in response to trouble reports. They generally assert that non-intrusive measurement is currently impossible, although they do not discuss the nature or extent of the intrusiveness.
Notably, Pacific Bell apparently alone among the carriers states that it will deploy passive monitoring for DS1 and above services in 1992. In addition, Pacific states that "national [m]onitoring transmission data is a national concern and Pacific Bell agrees that national standards should be developed and applied." However, Pacific Bell suggests that "any requirement for this measurement be deferred until after industry standards have been adopted and test systems are designed and deployed to collect the required information." Pacific does not state when these events may transpire.

QUESTION 1: Please report your internal standard for complaints per 100 lines for the following services: residential and business

Ameritech	Illinois Bell: 2.58 Indiana Bell: 2.35 Michigan Bell: 2.49 Ohio Bell: 2.50 Wisconsin Bell: 1.60
Bell Atlantic	5.0
BellSouth	5.3
GTE	Uses state-imposed standards, which range from 4.75 in North Carolina to 10 in Indiana; most states use a standard of 6 or 7 reports per 100 access lines.
Nevada Bell	6 is standard; 3Q actual was 1.63
New England	Goal: 2.8 Maximum Acceptable: 3.5
New York	Goal: 4.0 Maximum acceptable: 5.2
Pacific Bell	2.5 (1.3 was actual 1991 performance)
Southwestern Bell	3.7
United	2.6
US West	Residential: 3.0 Business: 1.8

Notes:

1. With the exception of US West, the LECs do not differentiate between residential and business.

2. Nevada Bell and United appear to use a different basis for calculation, so a direct comparison with the other LECs seems impossible.

QUESTION 2: Please list your standard installation and repair intervals for residential service.

A. INSTALLATION

Ameritech	Meet requested installation date; usually 1-3 days
Bell Atlantic	No standard; rely on customer satisfaction surveys -- minimum performance level is 90%
BellSouth	2 days if former customer, 4 days if not, except in Florida, where 3 days in either case
GTE	Follows PUC requirements; generally 90-95% within 3-5 days or less than 10% missed appointments
Nevada Bell	0-1 day in Reno and Carson City, 2-3 days elsewhere
New England	No standard -- rely on customer satisfaction surveys. Some NET states set standards: e.g., Massachusetts requires 85% installed with 3 days and no more than 4% missed appointments
New York	Objective 85-100% within 5 days. Minimum acceptable: 70% within 5 days
Pacific Bell	Customer specifies; PB meets 99% of 1-day requests, 99.2% of 2-3 day requests, 99+% of longer requests
Southwestern Bell	1-5 days, depending on state and workload; states have standards generally requiring 90-95% within 5 days
United	3 days for primary installations, 5 days for secondary unless PUCs impose different requirements
US West	80% within 2 days unless customer requests shorter or longer period

B. REPAIR

Ameritech	For trouble affecting service, next business day For out-of-service, within 24 hours
Bell Atlantic	No standard interval; minimum performance level is 84% customer satisfaction
BellSouth	Normally 24 hours
GTE	No standard interval
Nevada Bell	24 hours for most areas; M-F in larger communities, rolling 6-hour commitment; in remote areas repair services are provided in accordance with a pre-established dispatch schedule
New England	No internal standards; Massachusetts requires 70% trouble reports cleared within 24 hours, Rhode Island requires 63%
New York	80% trouble reports cleared within 24 hours; 10% missed appointments
Pacific Bell	No standard interval; standard for customer satisfaction with repair services is 95%
Southwestern Bell	No internal standard, but PUCs require 85-95% trouble reports cleared within 24 hours
United	24 hours for out-of-service; 48 hours for non-out-of-service. Some states establish standards averaging 85-95% cleared within 24 hours
US West	80% trouble reports received before 1 p.m. cleared same day; 80% received after 1 p.m. cleared the next day

QUESTION 3: Please list your standard installation and repair intervals for each of the following services:

A. FEATURE GROUP B

	Installation	Repair
Ameritech	1-8 trunks: 24/20 9-16 trunks: 26/22 17-24 trunks: 28/24	2.8 hours in Illinois, Indiana No interval in Michigan 2.5 hours in Ohio 4.0 hours in Wisconsin
Bell Atlantic	1-96 trunks: 10 days	Less than 24 hours; less than 2 hours for priority services. 81% satisfaction is minimum performance level
BellSouth	1-14 trunks: 15 days	5.5 hours
GTE	15 days	24 hours
Nevada Bell	1-5 trunks: 20 days; 6-10 trunks: 26 days; 11-15 trunks: 28 days; 16-35 trunks: 40 days; 36-96 trunks: 53 days	4 hours
New England Telephone	1-4 trunks: 28 days 5-8 trunks: 30 days	No standard

New York Telephone	1-8 trunks: 28 days; 9-16 trunks: 30 days; 17-24 trunks: 33 days; 25-32 trunks: 35 days; 33-48 trunks: 37 days	No standard
Pacific Bell	1-48 trunks: 30 days; 49-96 trunks: 32 days; 97-144 trunks: 34 days; 145-192 trunks: 40 days	4 hours
Southwestern Bell	1-8 trunks: 15 days	3 hours
United	1-24 trunks: 18-30 days (varies by state).	2-4 hours
US West	1-24 trunks: 18 days	2 hours in high density areas, 4 hours elsewhere

Notes:

1. Intervals are in working days for establishment of service. Some companies provide data for additional service without translations, which is substantially quicker; and with translations, which is somewhat quicker.

2. Installation intervals for quantities greater than amounts shown are negotiated with individual customers.

3. For Ameritech, first number is for analog, second number is for digital.

B. FEATURE GROUP C

	Installation	Repair
Ameritech	1-8 trunks: 24/20 9-16 trunks: 26/22 17-24 trunks: 28/24	2.8 hours in Illinois, Indiana No interval in Michigan 2.5 hours in Ohio 4.0 hours in Wisconsin
Bell Atlantic	1-96 trunks: 10 days	Less than 24 hours; less than 2 hours for priority services. 81% satisfaction is MPL.
BellSouth	1-14 trunks: 15 days	5.5 hours
GTE	15 days	24 hours
Nevada Bell	1-5 trunks: 20 days; 6-10 trunks: 26 days; 11-15 trunks: 28 days; 16-35 trunks: 40 days; 36-96 trunks: 53 days	4 hours
New England Telephone	1-4 trunks: 28 days 5-8 trunks: 30 days	No standard

New York Telephone	1-8 trunks: 28 days; 9-16 trunks: 30 days; 17-24 trunks: 33 days; 25-32 trunks: 35 days; 33-48 trunks: 37 days	No standard
Pacific Bell	1-48 trunks: 30 days; 49-96 trunks: 32 days; 97-144 trunks: 34 days; 145-192 trunks: 40 days	4 hours
Southwestern Bell	1-8 trunks: 15 days	3 hours
United	1-24 trunks: 18-30 days (varies by state).	2-4 hours
US West	1-24 trunks: 18 days	2 hours in high density areas, 4 hours elsewhere

---

Notes:

1. Intervals are in working days for establishment of service. Some companies provide data for additional service without translations, which is substantially quicker; and with translations, which is somewhat quicker.

C. FEATURE GROUP D

	Installation	Repair
Ameritech	1-8 trunks: 24/20 9-16 trunks: 26/22 17-24 trunks: 28/24	2.8 hours in Illinois, Indiana No interval in Michigan 2.5 hours in Ohio 4.0 hours in Wisconsin
Bell Atlantic	1-96 trunks: 10 days	Less than 24 hours; less than 2 hours for priority services. 81% satisfaction is MPL.
BellSouth	1-14 trunks: 15 days	5.5 hours
GTE	15 days	24 hours
Nevada Bell	1-5 trunks: 20 days; 6-10 trunks: 26 days; 11-15 trunks: 28 days; 16-35 trunks: 40 days; 36-96 trunks: 53 days	4 hours
New England Telephone	1-4 trunks: 28 days 5-8 trunks: 30 days	No standard

New York Telephone	1-8 trunks: 28 days; 9-16 trunks: 30 days; 17-24 trunks: 33 days; 25-32 trunks: 35 days; 33-48 trunks: 37 days	No standard
Pacific Bell	1-48 trunks: 30 days; 49-96 trunks: 32 days; 97-144 trunks: 34 days; 145-192 trunks: 40 days	4 hours
Southwestern Bell	1-8 circuits: 15 days	3 hours
United	1-24 trunks: 18-30 days (varies by state). >24 trunks generally ICB	2-4 hours
US West	1-24 trunks: 18 days >24 trunks: ICB	2 hours in high density areas, 4 hours elsewhere

---

Notes:

1. Intervals are in working days for establishment of service. Some companies provide data for additional service without translations, which is substantially quicker; and with translations, which is somewhat quicker.

D. VOICE GRADE SPECIAL ACCESS

	Installation	Repair
Ameritech	1-6 circuits: 10 days; 7-12 circuits: 14 days; 13-24 circuits: 25 days if facilities in place; otherwise 35 days	2.8 hours
Bell Atlantic	1-8 circuits: 9 days 9-16 circuits: 12 days 17-24 circuits: 16 days	No standard interval
BellSouth	1-8 circuits: 7 days 9-16 circuits: 10 days; 17-24 circuits: 13 days	4.5 hours
GTE	10 days	6.3 hours
Nevada Bell	1-4 circuits: 11 days ; 5-8 circuits: 13 days; 9-12 circuits: 14 days	Same day if request received before noon; 12 p.m. next day if received after noon
New England Telephone	1-8 circuits: 12 days	No standard interval
New York Telephone	1-4 circuits: 17 days (19 in N.Y.-N.J. corridor); 5-8 circuits: 23 days (19 in N.Y.-N.J. corridor)	No standard interval

Pacific Bell	1-4 circuits: 11 days	3.5 hours
Southwestern Bell	1-8 circuits: 7 days; 9-16 circuits: 9 days; 17-24 circuits: 12 days	3.5 hours
United	Varies by state. 1-4 circuits: 12-17 days. 5-8 circuits: 12-20 days	Varies by state; 2-4 hours
US West	1-4 circuits: 11 days	98% within 3 hours

Notes:

1. Figures shown are for two-point circuits. Intervals for installation of multi-point circuits are considerably longer.

E. WATS/800 ACCESS LINES

	Installation	Repair
Ameritech	Non-design: 6 days Design: 10 days interstate 12 days intrastate	Illinois Bell: 2.5 hours Indiana Bell: 3.2 hours Michigan Bell: 2.8 hours Ohio Bell: 3.0 hours Wisconsin Bell: 2.4 hours
Bell Atlantic	Non-design: 1-8 circuits, 4 days 9-16 circuits: 8 days 17-24 circuits: 11 days Designed: 1-8 circuits, 9 days 9-16 circuits, 12 days 17-24 circuits, 16 days	No standard interval
BellSouth	1-8 circuits: 7 days; 9-16 circuits: 10 days; 17-24 circuits: 13 days	4.5 hours
GTE	5 days	6.3 hours
Nevada Bell	WATS: 1-15 lines: 5 days same wire center; 15 days different wire center 800: 1-15 lines: 10 days	Same day if report received before noon; 12 p.m. next day if received after noon

New England Telephone	1-8 circuits: 12 days	No standard interval
New York Telephone	1-4 circuits: 17 days (19 in N.Y.-N.J. corridor); 5-8 circuits: 23 days (19 in N.Y.-N.J. corridor)	No standard interval
Pacific Bell	1-12 circuits: 5 days single wire center, 9 days multiple wire center	4 hours
Southwestern Bell	1-8 circuits: 7 days; 9-16 circuits: 9 days; 17-24 circuits: 12 days	3.5 hours
United	Varies by state; 1-4 circuits: 5-17 days; 5-8 circuits: 5-19 days	Varies by state; 2-4 hours
US West	1-8 circuits: 5-8 days	8 hours

F. METALLIC/TELEGRAPH ACCESS LINES

	Installation	Repair
Ameritech	1-6 circuits: 10 days 7-12 circuits: 14 days 13-24 circuits: 25 days if facilities in place; otherwise 35 days	2.8 hours, except 2.5 hours in Ohio
Bell Atlantic	Not disclosed	No standard interval
BellSouth	1-8 circuits: 7 business days; 9-16 circuits: 10 business days; 17-24 circuits: 13 business days	4.5 hours
GTE	10 days	6.3 hours
Nevada Bell	Negotiated	Same day if request received before noon; 12 p.m. next day if received after noon
New England Telephone	1-4 circuits: 17 days; 5-8 circuits: 23 days	No standard interval
New York Telephone	1-4 circuits: 17 days (19 in N.Y.-N.J. corridor)	No standard interval

Pacific Bell	1-12 circuits: 11 days	4 hours
Southwestern Bell	Negotiated	3.5 hours
United	Varies by state; 1-4 circuits: 11-17 days; 5-8 circuits: 12-17 days	Varies by state; 2-3.5 hours
US West	1-4 circuits: 11 days	ICB

G. AUDIO/VIDEO LINES

	Installation	Repair
Ameritech	Negotiated	2.8 hours
Bell Atlantic	Not disclosed	No standard interval
BellSouth	Negotiated	4.5 hours
GTE	10 days	6.3 hours
Nevada Bell	Negotiated	Same day if request received before noon; 12 p.m. next day if received after noon
New England Telephone	1-4 circuits: 17 days; 5-8 circuits: 23 days	No standard interval
New York Telephone	Not disclosed	No standard interval
Pacific Bell	Negotiated	Upon demand
Southwestern Bell	Negotiated	3.5 hours
United	Varied by state; 1-4 circuits: 12-27 days; 5-8 circuits: 12-28 days	Varies by state; 2-4 hours
US West	Negotiated	ICB

H. WIDEBAND CIRCUITS

	Installation	Repair
Ameritech	Service discontinued	2.8 hours
Bell Atlantic	Not disclosed	No standard interval
BellSouth	Negotiated	4.5 hours
GTE	10 days	6.3 hours
Nevada Bell	Not offered	N/A
New England Telephone	Negotiated	No standard interval
New York Telephone	Negotiated	No standard interval
Pacific Bell	1-5 circuits: 11 days	4 hours
Southwestern Bell	Negotiated	3.5 hours
United	Negotiated	Varies by state; 2-4 hours
US West	Not offered	N/A

I. DDS

	Installation	Repair
Ameritech	<56kbps: 1-4 circuits: 20 days (interstate) 15 days (intrastate) 5-8 circuits: 24 days 56kbps: 1-2 circuits: 26 days 3-4 circuits: 28 days	Illinois Bell: 2.2 hours Indiana Bell: 2.5 hours Michigan Bell: 2.8 hours Wisconsin Bell: 3.1 hours
Bell Atlantic	1-4 circuits: 9 days 5-8 circuits: 12 days 9-12 circuits: 16 days	No standard interval
BellSouth	<9.6 kbps: 1-4 circuits: 17 days >9.6 kbps: negotiated 56 kbps: 1-4 circuits, 15 days if facilities available, otherwise ICB	4.5 hours
GTE	10 days	6.3 hours
Nevada Bell	1-4 circuits: 13 days 5-8 circuits: 14 days 9-12 circuits: 18 days 13-16 circuits: 22 days	Same day if request received before noon; 12 p.m. next day if received after noon
New England Telephone	Negotiated	No standard interval

New York Telephone	31 days for terminations south of 59th St. in NYC; 41 days for all others	No standard interval
Pacific Bell	1-4 circuits: 13 days	2.5 hours
Southwestern Bell	Negotiated	3.5 hours
United	Varies by state; 1-4 circuits: 15-23 days; 5-8 circuits: 15-21 days	Varies by state; 2-3 hours
US West	1-4 circuits: 13 days	98% within 2 hours

J. HIGH CAPACITY

	Installation	Repair
Ameritech	1 circuit: 15/35/7; 15/40 2 circuits: 16/N/8; 16/N 3 circuits: 17/N/9; 17N 4 circuits: 18/N/10; 18/N	Illinois Bell: 2.2 hours Indiana Bell: 2.0 hours Michigan Bell: 2.8 hours Ohio Bell: 2.0 hours Wisconsin Bell: 2.4 hours
Bell Atlantic	Same as DS1/DS3	No standard interval
BellSouth	Negotiated	3.5 for DS-1 equivalent, 2.5 for DS-3 equivalent
GTE	15 days	6.3 hours
Nevada Bell	1-5 circuits: 19 days	Same day if request received before noon; 12 p.m. next day if received after noon
New England Telephone	Negotiated	No standard interval
New York Telephone	Negotiated	No standard interval